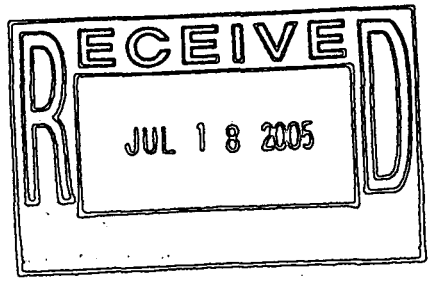
Rocky Flats Environmental Technology Site

TYPE 2
RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR)/PRE-DEMOLITION SURVEY REPORT (PDSR)

BUILDING 331 GARAGE CLOSURE PROJECT

REVISION 0

May 26, 2005



Change Control:

Rev 1. Revised Sections 1, 5, and 8, fixed typos – 6/1/05.
Rev 1. Revised Section 9, MARSSIM revision - 6/1/05.
Rev 1. Revised Attachment D, Beryllium Data Summary table sample location descriptions - 6/1/05
Rev 1. Revised Section 4.2 to address historical beryllium information – 6/2/05
Rev 1. Revised maps in Attachments C and D to address Room 117A typo – 6/2/05

CLASSIFICATION REVIEW NOT REQUIRED PER EXEMPTION NUMBER CEX-005-02

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May 26, 2005

Reviewed by: _____ Date: 5/26/05
Don Risoli, Quality Assurance

Reviewed by: _____ Date: 5/26/05
D.P. Snyder, RISS ESH&Q Manager

Approved by: _____ Date: 05/26/05
Cameron Freiboth, K-H D&D Project Manager

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ATTACHMENTS

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) and Pre-Demolition Survey (PDS) was performed to enable facility "Typing" per the DPP (10/8/98), and compliant disposition and waste management of the Building 331 Garage. Because this facility was an "anticipated" Type 2 facility, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) requirements. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces (i.e., floors, walls, ceilings, roofs, and equipment). The exterior radiological surveys for Building 331 Garage were performed as part of the RISS West Side Exterior PDS strategy effort. Environmental media beneath and surrounding the facility were not within the scope of this RLCR/PDSR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

The RLC/PDS encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

Potential radiological contamination exists in five embedded sanitary waste drains and piping in the concrete slab. The sanitary waste drains and piping ran through open trenches in the slab. The sanitary waste piping in the open trenches was removed and some of the open trenches were filled with concrete in the 1960's or 1970's when the building was converted from a research and development laboratory to a vehicle maintenance facility. Therefore, the remaining embedded sanitary waste drains and piping will be managed as LLW during demolition. The filled in trenches will be managed as potentially contaminated LLW until demolition and in-process demolition surveys prove otherwise. All other surfaces within the building met PDSP unrestricted release limits. Results indicate that no beryllium, asbestos, or chemical contamination exists in excess of the PDSP unrestricted release limits. All beryllium sample results were less than 0.1 $\mu g/100cm^2$. Most of the asbestos abatement was conducted prior the RLC/PDS. All remaining ACM (i.e., exterior window caulking and transite panels) will be abated prior to demolition. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable.

Based upon the data presented in this RLCR/PDSR, the Building 331 Garage is considered a Type 2 facility. To ensure the facility remains free of contamination and RLC/PDS data remain valid, Level 2 Isolation Controls have been established and the facility posted accordingly.

1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) and a Pre-Demolition Survey (PDS) was performed to enable compliant disposition and waste management of the Building 331 Garage. All facility surfaces were characterized in this RLC/PDS, including the interior and exterior surfaces of the facility. Environmental media beneath and surrounding the facility were not within the scope of this RLCR/PDSR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

Building 331 Garage was an "anticipated" Type 2 RFCA facility prior to the performance of this RLC/PDS effort. A Type 2 RLC had not yet been performed in this building because the building has been in operation until recently, thus, the majority of building surfaces were not accessible for characterization. Since this building was found to be potentially radiologically contaminated during the performance of this RLC/PDS effort, the building has been classified as a RFCA Type 2 facility. Since the performance of this RLC/PDS effort was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP), no further characterization of this building is necessary.

The Fire Department portion of Building 331 has already been characterized and documented in stand-alone Type 1 RFCA facility RLCR and submitted to the DOE and CDPHE for review and concurrence.

Rev1. | As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these is the Building 331 Garage. The location of this facility is shown in Attachment A, *Facility Location Map*. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Rev1. | Before this facility can be removed or demolished, a RLC and/or a PDS must be conducted; this document presents the RLC/PDS results. The RLC/PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facility (MAN-127-PDSP). The RLC/PDS was built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC/PDS effort. An RLC and /or PDS is performed before building demolition to define the pre-demolition radiological and chemical conditions of a facility. Pre-demolition conditions are compared with the unrestricted release limits for radiological and non-radiological contaminants. RLC/PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

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1.2 Scope

This report presents the pre-demolition radiological and chemical conditions of the Building 331 Garage. Environmental media beneath and surrounding the facility was not within the scope of this RLCR/PDSR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this RLC/PDS were the same DQOs identified in the Pre-Demolition survey Plan for D&D Facility (MAN-127-PDSP.) Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A facility-specific Historical Site Assessment (HSA) was conducted to understand the facility history and related hazards. The assessment consisted of facility walk-downs, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). These assessments were used to identify data gaps and needs, and to develop radiological and chemical characterization plans. The facility-specific HSA was documented in the *Historical Site Assessment Report (HSAR) for the Area 3 - Group 3 Facilities*, Dated February 2002, Revision 0. Refer to Attachment B, *Historical Site Assessment Report,* for a copy of the facility-specific HSAR. In summary, the HSAR identified minimal potential for radiological and chemical hazards.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

The Building 331 Garage was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to the RISS Characterization Project files).

Radiological survey package 331001 was developed for the interior surfaces of the Building 331 Garage. The survey package was developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Building 331 Garage was a MARSSIM Class 2 area based on process history as a former metallurgical laboratory and the low potential for residual contamination. The laboratory was completely stripped out, surveyed, and released in 1968, and has not been radiologically posted since then.

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A total of fifty-four (54) total surface activity (TSA) measurements (22 random, 30 biased and 2 QC), fifty-two (52) removable surface activity (RSA) measurements (22 random and 30 biased) and twenty-two (22) surface media (paint) samples and twenty-two (22) Pre and Post TSA and RSA measurements were collected from painted surfaces within the survey unit. A minimum alpha scan survey of 30% of the 2nd floor surfaces, 75% of the 1st floor surfaces, and 5% of wall and ceiling surfaces at biased locations was performed. None of the measurements, scans or sample results indicated elevated activity above applicable DCGL values.

Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Media samples were collected in accordance with RSP 16.03 *Radiological Samples of Building Media*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

Exterior radiological surveys for Building 331 Garage were performed as part of the West Side Exterior PDS Report, which was approved on March 24, 2005 by DOE and CDPHE. The West Side Exterior PDS Report confirmed that the exterior surfaces of Building 331 Garage do not contain radiological contamination above the surface contamination guidelines provided in the PDSP. The West Side Exterior PDS Report and survey data, statistical analysis results, and survey map locations are maintained in the RISS Characterization Project files.

Potential radiological contamination exists in five embedded sanitary waste drains and piping in the concrete slab. The sanitary waste drains and piping ran through open trenches in the slab. The sanitary waste piping in the open trenches was removed and some of the open trenches were filled with concrete in the 1960's or 1970's when the building was converted from a research and development lab to a vehicle maintenance facility. Therefore, the remaining embedded sanitary waste drains and piping will be managed as LLW during demolition. Since the sanitary waste drains did not drain directly into the open trenches but rather stayed within the sanitary waste piping, and since the surveys of all the remaining open trenches were less than the PDSP unrestricted release limits, the filled in trenches are not suspect for contamination. However, the filled in trenches will be managed as potentially contaminated LLW until demolition and in-process demolition surveys prove otherwise.

All other surfaces within the building met PDSP unrestricted release limits. Radiological survey data, statistical analysis results, and survey locations are presented in Attachment C, *Radiological Data Summary and Survey Maps*. Radiological survey unit packages are maintained in the RISS Characterization Project files. Level 2 Isolation Control postings are displayed on the facility to ensure no radioactive materials are inadvertently introduced.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

The Building 331 Garage was characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in the facility. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan (refer to RISS Characterization Project files) was developed during the planning phase that describes sampling requirements, the justification for the sample locations and estimated sample numbers. Contaminants of concern included asbestos, beryllium, RCRA/CERCLA constituents, lead and PCBs.

4.1 Asbestos

In 1997, a comprehensive Sitex ACM inspection report identified ACM inside the building. During the RLC/PDS, another comprehensive, invasive asbestos inspection was conducted in Building 331 Garage to determine the presence of other friable and non-friable asbestos containing building materials. A CDPHE-certified asbestos inspector conducted the inspections and sampling in accordance with the *Asbestos Characterization Protocol, PRO-563-ACPR, Revision 1*. Materials suspected of containing asbestos were identified for sampling at the discretion of the inspector. Three of the eight bulk samples of building materials suspected of containing asbestos were positive for ACM in the Building 331 Garage. Prior to the completion of the RLC/PDS, friable and non-friable asbestos abatement and satisfactory clearance sampling was conducted per CDPHE, Regulation No. 8, Part B, *Emission Standards for Asbestos*. Asbestos abatement is still in-progress for the exterior window caulking and transite panels and will be completed prior to demolition. The recent RLC/PDS asbestos laboratory analysis data and sample location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps*.

4.2 Beryllium (Be)

Based on the HSAR and personnel interviews, the Building 331 Garage may have contained beryllium parts during R&D lab operations in the 1950's and 1960's. However, there was not adequate historical and process knowledge to conclude that beryllium was not processed or stored in these facility. Therefore, random and biased beryllium sampling was performed in accordance with the PDSP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0, September 9, 1999.* Biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition. All beryllium smear sample results were less than 0.1 $\mu g/100cm^2$ and met the unrestricted release limits. Beryllium laboratory sample data and location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps*.

Rev 1. The HSAR indicated that Rooms 114 and 117 had a potential for beryllium contamination. Three beryllium swipes were collected in Room 117 during the PDS.

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Rev 1

Although no PDS swipes were collected in Room 114, swipes were collected in adjacent rooms to 114. Recent discussions with long time Rocky Flats workers have revealed that the main room of B331 is where the R&D gloveboxes were located and this is where the highest potential for beryllium would be - not room 114. To the best of the long time Rocky Flats workers knowledge, Room 114 was used as an office area. Out of the 60 PDS beryllium swipes collected, no trace of contamination was found anywhere in B331. Therefore, no further sampling is necessary or required.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on the HSAR, facility walk-downs and a review of RFETS waste management databases, Building 331 Garage was used for vehicle maintenance, and does not have a history of RCRA/CERCLA contamination. Based on the above historical and process knowledge, RCRA/CERCLA sampling was not performed as part of this PDSR. This facility may have contained RCRA regulated materials such as mercury switches, batteries, and fluorescent lamps, but all regulated materials were removed and managed in accordance with EPA and CDPHE regulations.

Sampling for lead in paint in this facility was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal. There were no high contamination areas in Building 331 Garage.

4.4 Polychlorinated Biphenyls (PCBs)

Based on the HSAR, interviews and a facility walk-down of the Building 331 Garage, PCB-containing equipment was never present in this building. Therefore, PCB sampling was not performed as part of the RLC/PDS. Based on the age of the building (constructed prior to 1980), paints used are assumed to contain PCBs, and all painted surfaces will be managed as PCB Bulk Product Waste.

5 PHYSICAL HAZARDS

Physical hazards associated with the Building 331 Garage consist of those common to standard industrial environments and include hazards associated with energized systems, utilities, and trips and falls. However, care should be taken during demolition activities as the Building 331 Garage is located near the following active IHSSs, PACs, and UBCs:

- IHSS 300-134 -S "Reactive Metal Disposal Site South". IHSS 300-703 "Building 331 north Area". IHSS 300-710 "Gasoline spill North of Building 331
- IHSS 300-711 "Nickel-Cadmium Battery Acid Spill Outside of Building 373". IHSS 300-713 "Caustic Spill North of Building 331"

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- UBC-331 – A portion of Building 331 Garage has a UBC under the old metallurgical lab

The facility has been relatively well maintained and is in good physical condition, therefore, does not present hazards associated with building deterioration. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of the Building 331 Garage, and consequent waste management, are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- the *number* of samples and surveys;
- the *types* of samples and surveys;
- the sampling/survey process as implemented "in the field"; and,
- the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of the Building 331 Garage will generate sanitary waste-PCB Bulk Product Waste and low-level radiological waste (LLW), as appropriate. Estimated waste volumes are presented below. There is no hazardous waste.

Waste Volume Estimates and Material Types							
Facility	**Concrete** (cu ft)	**Wood** (cu ft)	**Metal** (cu ft)	**Corrugated Sheet Metal** (cu ft)	**Wall Board** (cu ft)	**ACM** (cu ft)	**Other Waste** (cu ft)
331 Garage	Sanitary – 28,000 LLW-100	0	Sanitary - 1,610 LLW-10	0	Sanitary - 500	0	Sanitary-Built-up Roofing 2,000

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, the Building 331 Garage is classified as RFCA Type 2 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and is acceptable for demolition. The Type 2 classification is based on a review of historical and process knowledge, and newly acquired RLC/PDS data.

Potential radiological contamination exists in five embedded sanitary waste drains and piping in the concrete slab. The sanitary waste drains and piping ran through open trenches in the slab. The sanitary waste piping in the open trenches was removed and some of the open trenches were filled with concrete in the 1960's or 1970's when the building was converted from a research and development lab to a vehicle maintenance facility. Therefore, the remaining embedded sanitary waste drains and piping will be managed as LLW during demolition. The filled in trenches will be managed as potentially contaminated LLW until demolition and in-process demolition surveys prove otherwise. All other surfaces within the building met PDSP unrestricted release limits. Results indicate that no beryllium, asbestos, or chemical contamination exists in excess of the PDSP unrestricted release limits. All beryllium sample results were less than 0.1 $\mu g/100cm^2$. Most of the asbestos abatement was conducted prior the RLC/PDS. All remaining ACM (i.e., exterior window caulking and transite panels) will be abated prior to demolition. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable.

The RLC/PDS of the Building 331 Garage was performed in accordance with the DDCP and PDSP requirements. All PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. The Building 331 Garage does not contain hazardous waste. All demolition debris will be managed as sanitary waste-PCB Bulk Product Waste or LLW, as appropriate. Environmental media beneath and surrounding the facility will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. To ensure the Building 331 Garage remains free of further contamination, Level 2 Isolation Controls have been established with the required postings.

Revl. 1

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9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA),* July 19, 1996.

DOE Order 5400.5, *"Radiation Protection of the Public and the Environment."*

EPA, 1994. *"The Data Quality Objective Process,"* EPA QA/G-4.

K-H, 1999. *Decommissioning Program Plan,* June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 3, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facility*, Rev. 1, July 15, 2002.

Rev1. | MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual*, Rev. 1, August 2000 (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure,* Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, *Asbestos Characterization Procedure,* Revision 0, August 24, 1999.

PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.

RFETS, *Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.*

RFETS, *Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.*

RFCA Standard Operation Protocol for Recycling Concrete, September 28, 1999.

Historical Site Assessment Report (HSAR) for the Area 3 - Group 3 Facilities, Dated February 2002, Revision 0.

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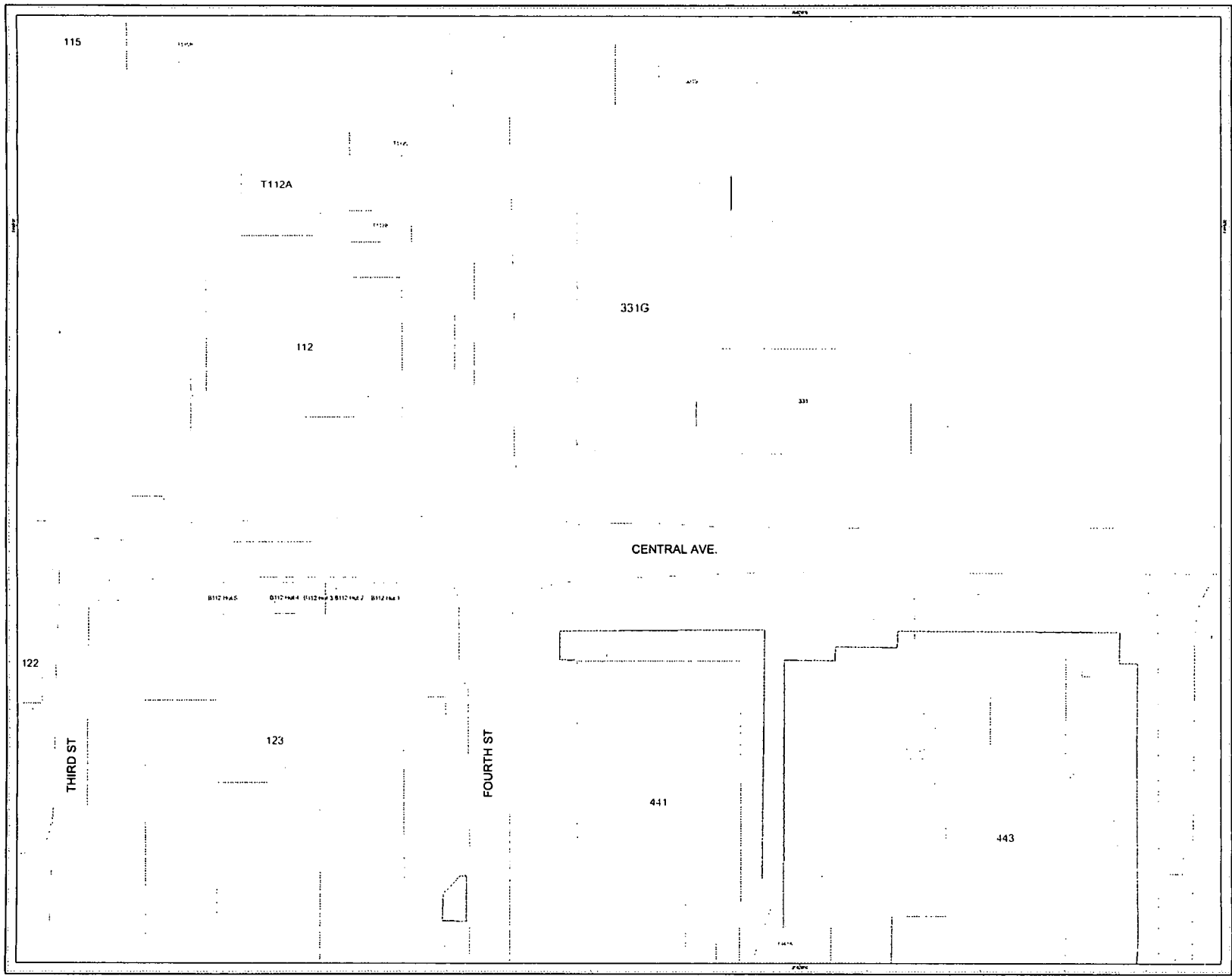
ATTACHMENT A

Facility Location Map

S1



Building 331F Location Plan

Standard Map Features

- Demolished Facility
- Remaining Facility
- 331G
- Demolished Roads
- Paved Roads
- Dirt Roads
- Railroad Removed
- Railroad Remaining
- Fence Remaining
- Stream or Ditch
- Lakes and Ponds

N

20 0 20 40 60 80 Feet

State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared By:
CH2MHILL
GIS DEPT (303) 966-7707

Prepared For:
KAISER-HILL COMPANY

DATE: 5/24/2005

PATH: \GISserv\GIS\Bldg_chem\Projects\FY2002\02-0568\8331_G.mxd

ATTACHMENT B

Historical Site Assessment Report

D&D RISS Facility Characterization
Historical Site Assessment Report
February, 2002 Rev. 0

Facility ID: Buildings 331, C331, 331F, 331S, 334, T334B, T334D, and 335.
Anticipated Facility Type (1, 2, or 3): Buildings 331, C331, 331F, 331S, 334, T334B, T334D, and 335 are anticipated Type 1 facilities.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Physical Description

Building 331

Building 331 is the Fire Station and Vehicle Maintenance Garage. This building is a two-story structure built in 1953 and has a total of 23,540 sq. ft. of floor space. Building 331 has had three additions to its original structure. In 1960 a 400 sq. ft. addition was added to the west of Room 114. In 1967 a 400 sq. ft. tool shed was added to the north side of the 1960 addition. In 1968 a 2,400 sq. ft. addition was added to provide additional office space and off-shift living quarter for the RFETS fireman.

The roof is constructed of concrete panels covered with built up roofing. The walls of the original building are constructed of re-enforced concrete, the 1960 addition is constructed of enforced concrete, the 1967 addition is constructed of corrugated metal walls on a steel from, and the 1968 addition is constructed of cinder blocks. The floors are poured concrete on grade.

Building 331 is serviced by the following utilities; water, sanitary, electric, and steam heat. An overhead sprinkler system and wall-mounted fire extinguishers provide fire protection.

Building C331

Building C331 is an 800 sq. ft. structure placed into service in 1975. The structure is made up of two cargo containers spaced approximately 20 ft. apart, with a roof supported by the cargo containers. The north and south walls are made of plywood with a man entrance on the south end of the building and a roll-up door on the north end of the building. The east and west walls are the sides of the cargo containers. The roof is constructed of wood covered with asphalt shingles and no insulation. The floor is a concrete slab poured on grade.

Building C331 is serviced by the following utilities: electrical and fire protection is provided by wall mounted fire extinguishers.

Building 331F

Building 331F is the fuel filling station and was constructed in 1996. Building 331F consists of a 54 sq. ft. light metal frame building designed to house a filling station attendant (currently used to store supplies) and 5 gas station style fuel pumps built on a concrete slab, which acts as a parking area for vehicles being fueled. Building 33F has 5 underground fuel tanks (TK-5A, TK-5B, TK-6A, TK-7Aand TK-8A).

Building 331F has the following utilities: electrical and fire protection is provided by wall mounted fire extinguishers.

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Building 331S

Building 331S is made up of 5 cargo containers placed in a row and a wooden open-ended enclosure used for storage on the east side of the cargo containers. The metal enclosure has metal side with wooden support members and a metal roof. This facility is built on an asphalt pad north of Building 331

Building 331S has the following utilities; electric and fire suppression is provided by a wall-mounted fire extinguisher.

Building 334

Building 334 is the General Office and Maintenance Shop Facility and was built in 1953. This building has 42,960 sq. ft. of floor space, including the mezzanine. Building 334 has had two additions to the original structure. In 1970 a 6,000 sq. ft addition was added to the east side of the original structure, and in 1985 a 3,200 sq. ft. addition was added to the north side of the 1970 addition.

The roof is constructed of concrete panel covered with built up roofing. The wall of the original building are constructed of re-enforced concrete, the 1970 addition is re-enforced concrete, and the 1985 addition is constructed of cinder blocks. The floors are poured concrete on grade.

Building 334 is serviced by the following utilities; water, sanitary, electric, and steam heat. Fire protection is provided by an overhead sprinkler system and wall-mounted fire extinguishers.

Building T334B

Building T334B is a 1960 sq. ft. General Office Trailer purchased in 1984. T334B has corrugated metal siding with a metal roof. T334B has hard walled offices and a large conference area in the center.

Trailer T334B is serviced by the following utilities; electric, fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

Building T334D

Building T334D is a 600 sq. ft. General Office Trailer purchased in 1990. T334B has corrugated metal siding with a metal roof. T334B has hard walled offices on both ends and a central work area divided into cubicles.

Trailer T334D is serviced by the following utilities; Electric, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

Building 335

Building 335 is the fire training building and was constructed in 1969. Building 335 is a 2,160 sq. ft. metal frame building with corrugated metal sides and roof, built on a concrete slab. The west section of the building was added in 1973. Tank 115 is a propane tank located north of the building and is used to provide an ignition source during the fire training exercises. On the north side of Building 335 is an 8 ft. by 15 ft. metal carbon dioxide fire extinguisher filling station constructed on a concrete pad. The carbon dioxide filling station was purchased as a used piece of equipment (likely manufactured in the 1960s) and installed in the early 1980s, and has been out of service since 1995.

Building 335 is serviced by the following utilities: electric water, and fire protection is provided by wall mounted fire extinguishers. The east side of the structure has an overhead sprinkler system, which is used for fire training purposes only.

Historical Operations

Building 331

Building 331 houses both the site vehicle maintenance garage and the site fire department. This facility was constructed in 1953 and has had several addition, which are documented in the building description section above,

The garage portion of Building 331 houses the vehicle maintenance garage. RFETS vehicles and equipment with small engines are maintained in the Building 331 garage. Occasionally spills of gasoline, oil, and antifreeze occur and are cleaned-up using an absorbent. This absorbed waste is disposed of in accordance with waste operations guidelines. Used antifreeze, oils, and lead-acid batteries are sent off site for re-cycle.

Rooms 113, 114, 115, 116, and 117 were used from 1953 to 1968 as a small metallurgical R & D laboratory, which handled some depleted uranium material. This laboratory was stripped out and converted to a storage area and a work area for the garage in 1968. An old sanitary drain, which was covered with a steel plate, has the following label: "Radioactive contamination in sanitary drain, 3-21-77" still remains in Room 114 of the garage area. Building 331 has no process waste lines.

The Fire Department portion of Building 331 is used to house fire equipment and trucks, as well as office space and off-shift living quarters for the RFETS fireman. This facility is used to clean fire response equipment, to perform self-contained breathing apparatus (SCBA) maintenance, and Haz Mat spill control equipment.

The most common spills that the Haz Mat team responds to are oil, antifreeze, hydraulic fluid, and gasoline and diesel fuel. Spill clean-up material prior to the mid 1980s was staged in hose tower basin (with a french drain) prior to disposal. Spill clean-up material is currently handled on a case-by-case basis, at the direction of waste operations personnel. See the Building 331 WISRC for additional Building 331 waste steam descriptions. See the Historical Operation section for Building 331F for a discussion on the history of the filling station originally located south of Building, later moved to the north side of Building 331, and foamed in place in 1996.

Building C331

Building C331 is constructed with two cargo containers placed about 20 feet apart and a roof connecting the two cargo containers. The cargo containers and the work area between the cargo containers is used to store grounds-keeping equipment and supplies such as lawn tractors, weed-whackers, hand tools, and other grounds-keeping supplies and equipment.

Building 331F

Building 331F is the new filling station and is used to fill RFETS vehicle with fuel (diesel and gas). Building 331F consists of a small metal frame building designed to house a filling station attendant (currently used to store supplies), and 5 gas station style fuel pumps located on a concrete slab, which acts as a parking area for vehicles being fueled. Building 331F has 5 underground fuel tanks (TK-5A, TK-5B, TK-6A, TK-7Aand TK-8A).

Building 331F was constructed to replace the old filling station that was located just north of Building 331. The old filling station was removed when the new station was constructed in 1996. The old filling station tanks were cleaned and foamed in place in 1996. The tank number for the old filling station are Tanks 101,102, 103, 104.

The original filling station (constructed in 1953) was located south of Building 331. In the late 1950s the original filling station was moved to the north side of Building 331 and is refereed to as the old filling station (documented above). The tanks were believed to have been excavated and moved to the new location north of Building 331 in the late 1950s. There is no documentation indicating that the original tanks are still in place on the north side of Building 331.

Building 331S

Building 331S is made up of 4 cargo containers placed in a row and a metal open-ended enclosure that stores used tires, new drummed product (mostly oils), and some non-regulated used absorbent containing spilled liquids (diesel and oils). Liquid drums are placed on a secondary containment pallet. The material stored here is not RCRA regulated. The cargo containers are used to store spare parts and tires for the maintenance of the RFETS fleet of equipment by Building 331 personnel.

Building 334

Building 334 is the primary RFETS maintenance facility. This building has both offices and shops to support maintenance activities at RFETS. These activities include electrical, carpentry, sheet metal work, pipe fitting, HVAC, glass shop, machining, welding and an instrument shop (a.k.a. Standards Lab). Wastes such as used oils, hydraulic fluids, and coolants are put in appropriate waste containers then processed through waste operations group for disposition. In the 1960s, several pieces of equipment, from Building 444 and 881, were installed in the Buildings 334 machine shop. When this equipment was removed in the 1980s, radiological contamination was found in, and under, some of this machinery in the machine shop. See the Building 334 WISRC for additional Building 334 waste steam descriptions. On a few occasions in the 1960s, uranium parts were escorted to building 334 for some specialty machine work. After this work was performed, the machines were cleaned and the area surveyed.

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Trailer T334B

Trailer T334B is a general office trailer used by the RFETS Roads and Ground Department. Prior to becoming the general office trailer for Roads and Grounds personnel in 1999, the trailer was used as a general office trailer for PU&D. This trailer has historically always been used as a general office support trailer since it came on site in 1984.

Trailer T334D

Trailer T334D is a general office trailer used to house fire department support personnel. This trailer has historically always been used as a general office trailer since it came on site in 1990.

Building 335

Building 335 is used for fire training exercises and fire extinguisher maintenance activities. The building is partitioned in the center. The east portion of the building is used for fire training purposes and is lined with wallboard. Several times a year, fires were started in the east side of the building to study t fire behavior and to provide training in the extinguishing of fires. This practice stopped in the 1980s. The walls and ceiling are covered with smoke residue from the training exercises. Source material used in the training exercises were actual waste streams from Building 444 and other facilities in the 400 area. The wastes included oils, solvents, pyrophoric metals, and on occasions, depleted uranium.

The west side of the building was used to re-charge and maintain fire extinguisher for RFETS. These fire extinguishers were located in all areas of the plant. On several occasions in the 1980s, fire extinguishers in the building for maintenance were found to be radiologically contaminated. Chemicals used to fill fire extinguishers include carbon dioxide, halon, nitrogen, momo-ammonium phosphate, and sodium chloride. See the Building 335 WISRC for additional Building 335 waste steam descriptions

Current Operational Status

Buildings 331, C331, 331F, 331S 334, and 335 are all currently operational. Building 335 is in the process of having the equipment stripped out to begin D&D activities

Contaminants of Concern

Asbestos

Describe any potential, likely, or known sources of Asbestos:

The IH group in Trailer T130B has an Asbestos Inspection Plan and Operations Maintenance Plan for Buildings 331 and 334, that summarized some general historical asbestos data. The Trailer Asbestos Management Program Baseline summarized some general T334B and T334D historical asbestos data.

The remaining facilities in the HSA have no known comprehensive asbestos surveys.

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Beryllium (Be)

Describe any potential, likely, or known Be production or storage locations:

The only building addressed in this HSA on the List of known Be areas is Building 331 (Rooms 114 and 117), which is listed because of its historical use as a metallurgical laboratory involving some beryllium operations. In the past, the fire Department side of Building 331 has, on occasion, had a positive hit for beryllium on fire fighting equipment, which has entered beryllium areas. When beryllium contamination was detected on equipment, the equipment was always cleaned. The fire department side of Building 331 is not known to have any current Beryllium contamination problems.

Summarize any recent Be sampling results:

No resent Be samples collected on any of these facilities.

Lead

Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):

Lead in paint and lead in electrical equipment may be a concern for some of the facilities in this HSA due to the age of construction. Lead shielding was not known to have been used in any of these facilities.

See the section below for RCRA/CERCLA constituents for lead in waste steam references related to these buildings.

RCRA/CERCLA Constituents

Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):

Building 331, C331, and 334 have had occasional small spills from gasoline, diesel, oils, hydraulic fluids and antifreeze. These spills were normally cleaned using an absorbent and the used absorbent properly disposed of. Used oils and antifreezes are re-cycled. The fire department hose tower (Building 331) was used until the late 1980s to temporarily store absorbed spill response waste. The tanks for the old filling station have been cleaned and foamed in place in 1996. See the Building specific WSRIC for more detailed listing of the waste streams associated with each building addressed in this HSA.

Building 331 housed RCRA Unit 2, which was closed in 1996 in accordance with the RCRA Closure Plan for B331. No other buildings addressed in this HSA is associated with Permitted RCRA Units.

Describe any potential, likely, or known spill locations (and sources, if any):

Small volume spills of gasoline, Diesel, oil, hydraulic fluids, and antifreeze occurred in many of these facilities and are discussed in the "Process History" section above. Additional, RCRA/CERCLA release information is documented in the IHSS, PAC, and UBC section below.

Describe methods in which spills were mitigated, if any:

Spills were normally absorbed and disposed of in accordance with RFETS requirements.

PCBs

Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):

Due to the age of these facilities, there may be a concern with PCBs in paint, light ballasts, and electrical equipment. PCBs where not known to have been regularly handled in any of these facilities.

Describe any potential, likely, or known spill locations (and sources, if any):

No known PCB spills occurred in any of the facilities addressed in this HSA.

Describe methods in which spills were mitigated, if any:

No known PCB spills occurred in any of the facilities addressed in this HSA.

Radiological Contaminants

Describe any potential, likely, or known radiological production or storage locations:

None of the buildings in this HSA are currently radiologically posted. In the early history of Building 331, a small R&D metallurgical laboratory was operated in the garage portion of the building. In the late 1950s, a truck being worked on in the garage was found to have contamination on the bed of the truck (cross contamination from hauling contaminated drums). No building contamination was identified. In the past; the fire Department side of Building 331 has, on occasion, found radiological contamination on fire fighting equipment, which has entered contaminated areas. When contamination was detected it was always cleaned.

During fire training exercises in Building 335, actual waste steams from Building 444 were frequently used as fuel for these training fires. Some of this waste contained depleted uranium.

Building 334 has not housed any radiological processes, but has had equipment installed in the machine shop from Building 444 and 881. Some hot spots of uranium were detected on the equipment and under the equipment during equipment removal in the 1980s. On a few occasions in the 1960s, uranium parts were escorted to building 334 for some specialty machine work. After this work was performed the machines were cleaned and the area surveyed. Building 334 is not radiologically posted.

Building C331, 331F, 331S, T334B, and T334D have no history of radiological contamination. See individual building histories above for a more detailed description of historical operations.

Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):

Building 331 has several contaminated sanitary drains in the old metallurgical laboratory rooms.

Describe methods in which spills were mitigated, f any:

No known spills.

Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):

The primary Isotope of concern includes, but is not limited to depleted uranium. Other than sealed sources, there were no known mixed fission products or pure beta emitters used in any of the facilities addressed in the HSA.

Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):

See section below for information on IHSSs PACs, and UBCs.

Environmental Restoration Concerns

Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):

Building 331 is associated with or located near the following active IHSSs, PACs, and UBCs;

1) IHSS 300-134 -S "Reactive Metal Disposal Site South", Active.
2) IHSS 300-703 "Building 331 north Area", NFA approved in 1992, CDPHE approved as proposed in 2001.
3) IHSS 300-710 "Gasoline spill North of Building 331, NFA approved 1992, CDPHE approved as proposed in 2001.
4) IHSS 300-711 "Nickel-Cadmium Battery Acid Spill Outside of Building 373" Proposed NFA HRR Quarterly update January 1994.
5) IHSS 300-713 "Caustic Spill North of Building 331", " Proposed NFA HRR Quarterly update April, 1994.
6) UBC-331 – A portion of Building 331 has a UBC under the old metallurgical lab.

Building 334 is associated with or located near the following active IHSSs, PACs, and UBCs;

1) IHSS 300-709 "Transformer Leak – 334-1", Proposed NFA in 1996 (currently under review with regulatory agencies).
2) IHSS 300-156.1 "Building 371 Parking Lot", NFA approved in 2001.

Building 335 is associated with or located near the following IHSSs, PACs, and UBCs;

1) IHSS 300-134-N "Lithium Metal Distraction Site", Active.
2) IHSS 300-128 "Oil Burning Pit No. 1", Active.
3) IHSS 300-171 "Solvent Burning Ground", Active.

Building 331F and 331S are on the edge of the border of IHSS 300-134-S "Reactive Metal Disposal Site South". Buildings C331, T334B, and T334D are not directly referenced in any IHSSs, PACs, and UBCs.

Additional Information

Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):

None

References

Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews):

Sources reviewed to complete this HSA were the RFETS Facility List, the Historical Release Report, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. Building 331, 334, and 335 WSRICs, (Building C331, 331F, T334B, and T334D do not have WSRICs). In addition, a facility walkdown and interviews were performed.

Waste Volume Estimates and Material Types							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 331	44,500	0	2,800	0	900	TBD	Built-up Roofing 3,600 cu ft
Building C331	250	150	None	None	None	TBD	cargo containers are excluded from estimate
Building 331F	900	None	100	40	None	TBD	None
Building 331S	None	50	None	100	None	TBD	Asphalt 400, cargo containers are excluded from estimate
Building 334	85,500	0	5,900	0	1,800	TBD	Built-up Roofing 6,800 cu ft
Trailer T334B	None	400	500	800	1,000	TBD	None
Trailer T334D	None	275	250	350	450	TBD	None
Building 335	2500	None	600	900	300	TBD	None

Further Actions

Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):

Begin the RLC/PDS process.

Note:

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in this report. Newer Data will appear in the RLCR/PDSR.

Prepared By: Doug Bryant / [signature] February 2002

Name Signature Date

For Doug Bryant

ATTACHMENT C

Radiological Data Summaries and Survey Maps

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 22 | Nbr Biased Measurements Required: 30 | Nbr QC Required: 2

Nbr Random Measurements Performed: 22 | Nbr Biased Measurements Performed: 30 | Nbr QC Performed: 2

Alpha

Maximum:	58.8 dpm/100cm²
Minimum:	-3.0 dpm/100cm²
Mean:	19.2 dpm/100cm²
Standard Deviation:	14.8
QC Maximum:	24.0 dpm/100cm²
QC Minimum:	21.3 dpm/100cm²
QC Mean:	22.7 dpm/100cm²
Transuranic DCGLw:	100.0 dpm/100cm²
Transuranic DCGLemc:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 22 | Nbr Biased Measurements Required: 30

Nbr Random Measurements Performed: 22 | Nbr Biased Measurements Performed: 30

Alpha

Maximum:	6.1 dpm/100cm²
Minimum:	-1.2 dpm/100cm²
Mean:	1.2 dpm/100cm²
Standard Deviation:	1.5
Transuranic DCGLw:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 16 | Nbr Biased Required: 6

Nbr Random Collected: 16 | Nbr Biased Collected: 6

Uranium

Maximum:	151 dpm/100cm²
Minimum:	30 dpm/100cm²
Mean:	81 dpm/100cm²
Standard Deviation:	44
Uranium DCGLw:	5,000 dpm/100cm²
Uranium DCGLemc:	15,000 dpm/100cm²

Transuranic

Maximum:	0 dpm/100cm²
Minimum:	0 dpm/100cm²
Mean:	0 dpm/100cm²
Standard Deviation:	0
Transuranic DCGLw:	100 dpm/100cm²
Transuranic DCGLemc:	300 dpm/100cm²

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	511390	04/07/05	Electra	3370	DP-6	07/27/05	0.213	NA	48.0	NA	T/S
2	515538	04/12/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R
3	511390	04/12/05	Electra	3370	DP-6	07/27/05	0.213	NA	48.0	NA	T/S
4	511390	04/13/05	Electra	1379	DP-6	05/09/05	0.222	NA	48.0	NA	T/S
5	515538	04/14/05	Electra	3370	DP-6	07/27/05	0.213	NA	48.0	NA	T/S
6	511390	04/14/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R
7	511390	04/18/05	Electra	3370	DP-6	07/27/05	0.213	NA	48.0	NA	T/S
8	515538	04/18/05	Electra	2352	DP-6	06/09/05	0.221	NA	300.0	NA	S
9	511390	04/18/05	Electra	2352	DP-6	06/09/05	0.221	NA	48.0	NA	Q/S
10	515538	04/18/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R
11	511390	04/19/05	Electra	1379	DP-6	05/09/05	0.222	NA	48.0	NA	T/S
12	515538	04/19/05	Electra	657	AP-6	06/13/05	0.184	NA	300.0	NA	S
13	515538	04/20/05	Electra	657	AP-6	06/13/05	0.184	NA	300.0	NA	S
14	515538	04/20/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R
15	515538	04/25/05	Electra	2352	DP-6	06/09/05	0.221	NA	48.0	NA	T/Q
16	515538	04/26/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R
17	513922	05/23/05	Electra	3254	DP-6	07/04/05	0.225	NA	48.0	NA	T/S
18	514256	05/23/05	Electra	3102	DP-6	06/16/05	0.216	NA	48.0	NA	T/S
19	515538	05/23/05	Electra	674	AP-6	08/02/05	0.182	NA	300.0	NA	S
20	513922	05/23/05	Electra	281	AP-6	09/17/05	0.180	NA	300.0	NA	S
21	513922	05/23/05	SAC-4	767	NA	08/03/05	0.330	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Comments Sheet

General Comments: N/A

TSA Comments: For instruments that were used for both TSAs and scans (T/S) on the Instrument Data Sheet, The TSA A-Priori MDA is 48.0 and the scan A-Priori MDA is 300.0.

RSA Comments: N/A

Media Comments:
1. 16 Media samples were collected from the painted random locations. The other 6 random locations were not painted.
2. 6 additional media samples were collected at biased locations.

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Random Removable Surface Activity Data Sheet

	Pre Media Sample Data			Post Media Sample Data		
Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)
331001PRP-N001	2	-0.3	N/A	6	2.2	N/A
331001PRP-N002	2	1.2	N/A	10	2.2	N/A
331001PRP-N003	10	1.5	N/A	10	4.3	N/A
331001PRP-N004	10	0.0	N/A	10	4.3	N/A
331001PRP-N005	2	1.2	N/A	6	0.0	N/A
331001PRP-N006	10	0.0	N/A	N/A	N/A	N/A
331001PRP-N007	2	-0.3	N/A	2	-0.4	N/A
331001PRP-N008	2	-0.3	N/A	6	4.3	N/A
331001PRP-N009	2	-0.3	N/A	2	1.8	N/A
331001PRP-N010	2	-0.3	N/A	2	1.8	N/A
331001PRP-N011	6	0.0	N/A	6	0.0	N/A
331001PRP-N012	2	-0.3	N/A	2	-0.4	N/A
331001PRP-N013	10	1.5	N/A	N/A	N/A	N/A
331001PRP-N014	2	-0.3	N/A	2	1.8	N/A
331001PRP-N015	10	6.1	N/A	N/A	N/A	N/A
331001PRP-N016	10	1.5	N/A	N/A	N/A	N/A
331001PRP-N017	14	2.4	N/A	N/A	N/A	N/A
331001PRP-N018	14	0.9	N/A	N/A	N/A	N/A
331001PRP-N019	6	1.5	N/A	6	2.2	N/A
331001PRP-N020	2	-0.3	N/A	6	4.3	N/A
331001PRP-N021	2	-0.3	N/A	6	2.2	N/A
331001PRP-N022	6	0.0	N/A	6	2.2	N/A

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Biased Removable Surface Activity Data Sheet

	Pre Media Sample Data			Post Media Sample Data		
Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)
331001PBP-N023	6	0.0	N/A	6	4.3	N/A
331001PBP-N024	6	1.5	N/A	6	0.0	N/A
331001PBP-N025	6	0.0	N/A	6	0.0	N/A
331001PBP-N026	6	0.0	N/A	6	0.0	N/A
331001PBP-N027	6	0.0	N/A	6	2.2	N/A
331001PBP-N028	6	0.0	N/A	6	4.3	N/A
331001PBP-N029	14	0.9	N/A	N/A	N/A	N/A
331001PBP-N030	14	2.4	N/A	N/A	N/A	N/A
331001PBP-N031	14	2.4	N/A	N/A	N/A	N/A
331001PBP-N032	16	-1.2	N/A	N/A	N/A	N/A
331001PBP-N033	16	1.8	N/A	N/A	N/A	N/A
331001PBP-N034	16	-1.2	N/A	N/A	N/A	N/A
331001PBP-N035	16	0.3	N/A	N/A	N/A	N/A
331001PBP-N036	16	0.3	N/A	N/A	N/A	N/A
331001PBP-N037	16	1.8	N/A	N/A	N/A	N/A
331001PBP-N038	21	2.7	N/A	N/A	N/A	N/A
331001PBP-N039	21	2.7	N/A	N/A	N/A	N/A
331001PBP-N040	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N041	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N042	21	-0.3	N/A	N/A	N/A	N/A
331001PBP-N043	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N044	21	2.7	N/A	N/A	N/A	N/A
331001PBP-N045	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N046	21	2.7	N/A	N/A	N/A	N/A
331001PBP-N047	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N048	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N049	21	-0.3	N/A	N/A	N/A	N/A

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Biased Removable Surface Activity Data Sheet

	Pre Media Sample Data			Post Media Sample Data		
Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)
331001PBP-N050	21	2.7	N/A	N/A	N/A	N/A
331001PBP-N051	21	1.2	N/A	N/A	N/A	N/A
331001PBP-N052	21	1.2	N/A	N/A	N/A	N/A

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Random/QC Total Surface Activity Data Sheet

	Pre Media Sample Data			Post Media Sample Data		
Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)
331001PRP-N001	7	16.2	N/A	8	16.7	N/A
331001PRP-N002	7	36.4	N/A	8	22.6	N/A
331001PRP-N003	7	16.2	N/A	8	10.4	N/A
331001PRP-N004	7	14.8	N/A	8	23.9	N/A
331001PRP-N005	4	-3.0	N/A	4	8.9	N/A
331001PRP-N006	7	-2.6	N/A	N/A	N/A	N/A
331001PRP-N007	3	-2.6	N/A	3	20.7	N/A
331001PRP-N008	4	6.0	N/A	4	10.3	N/A
331001PRP-N009	3	3.5	N/A	3	23.9	N/A
331001PRP-N010	3	22.3	N/A	3	30.0	N/A
331001PRP-N011	4	10.5	N/A	4	25.6	N/A
331001QRP-N011	15	21.3	N/A	N/A	N/A	N/A
331001PRP-N012	3	-2.6	N/A	3	-0.9	N/A
331001PRP-N013	7	6.8	N/A	N/A	N/A	N/A
331001PRP-N014	3	3.5	N/A	3	31.9	N/A
331001PRP-N015	5	28.8	N/A	N/A	N/A	N/A
331001QRP-N015	9	24.0	N/A	N/A	N/A	N/A
331001PRP-N016	7	10.1	N/A	N/A	N/A	N/A
331001PRP-N017	11	7.4	N/A	N/A	N/A	N/A
331001PRP-N018	11	9.2	N/A	N/A	N/A	N/A
331001PRP-N019	5	10.1	N/A	5	14.5	N/A
331001PRP-N020	5	12.9	N/A	5	36.6	N/A
331001PRP-N021	5	22.3	N/A	5	42.7	N/A
331001PRP-N022	5	0.7	N/A	5	36.6	N/A

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Biased Total Surface Activity Data Sheet

	Pre Media Sample Data			Post Media Sample Data		
Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)
331001PBP-N023	5	6.5	N/A	5	38.0	N/A
331001PBP-N024	5	25.3	N/A	5	22.1	N/A
331001PBP-N025	4	5.7	N/A	4	5.8	N/A
331001PBP-N026	4	14.7	N/A	4	1.3	N/A
331001PBP-N027	4	23.7	N/A	4	37.3	N/A
331001PBP-N028	4	1.2	N/A	4	37.3	N/A
331001PBP-N029	11	19.2	N/A	N/A	N/A	N/A
331001PBP-N030	11	11.6	N/A	N/A	N/A	N/A
331001PBP-N031	11	29.6	N/A	N/A	N/A	N/A
331001PBP-N032	15	2.6	N/A	N/A	N/A	N/A
331001PBP-N033	15	14.8	N/A	N/A	N/A	N/A
331001PBP-N034	15	5.8	N/A	N/A	N/A	N/A
331001PBP-N035	15	2.6	N/A	N/A	N/A	N/A
331001PBP-N036	15	7.2	N/A	N/A	N/A	N/A
331001PBP-N037	15	9.0	N/A	N/A	N/A	N/A
331001PBP-N038	17	35.3	N/A	N/A	N/A	N/A
331001PBP-N039	18	37.2	N/A	N/A	N/A	N/A
331001PBP-N040	17	26.4	N/A	N/A	N/A	N/A
331001PBP-N041	18	37.2	N/A	N/A	N/A	N/A
331001PBP-N042	17	26.4	N/A	N/A	N/A	N/A
331001PBP-N043	18	15.5	N/A	N/A	N/A	N/A
331001PBP-N044	17	26.4	N/A	N/A	N/A	N/A
331001PBP-N045	18	58.5	N/A	N/A	N/A	N/A
331001PBP-N046	17	26.4	N/A	N/A	N/A	N/A
331001PBP-N047	18	12.2	N/A	N/A	N/A	N/A
331001PBP-N048	17	37.9	N/A	N/A	N/A	N/A
331001PBP-N049	18	37.2	N/A	N/A	N/A	N/A

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Biased Total Surface Activity Data Sheet

	Pre Media Sample Data			Post Media Sample Data		
Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)
331001PBP-N050	17	58.8	N/A	N/A	N/A	N/A
331001PBP-N051	18	52.5	N/A	N/A	N/A	N/A
331001PBP-N052	17	32.1	N/A	N/A	N/A	N/A

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Media Samples Data Sheet

Site Sample ID / Nbr --- Description	Nuclide	Sample (pCi/g)	Sample MDA (pCi/g)	Weight (g)	Surface Area (in^2)	Sample Nuclide ($dpm/100cm^2$)	Sample Nuclide MDA ($dpm/100cm^2$)	Sample Total ($dpm/100cm^2$)
05Z1174-023.001 23 1, 2, 3, 4	U234	0.0000	79.2000	20.80	26.3	0	2,155	
	U235	0.4590	0.2110			13	6	**Uranium**
	U238	1.3900	0.9540			38	26	50
	Pu239/240	0.0000	1.4969			0	41	**Transuranic**
	Am241	0.0000	0.2160			0	6	0
05Z1174-024.001 24 5, 7	U234	0.0000	82.1000	21.60	26.3	0	2,320	
	U235	0.5590	0.2270			16	6	**Uranium**
	U238	1.5500	1.3800			44	39	60
	Pu239/240	0.0000	1.6701			0	47	**Transuranic**
	Am241	0.0000	0.2410			0	7	0
05Z1174-025.001 25 8, 9, 10	U234	0.0000	76.5000	24.70	26.3	0	2,472	
	U235	0.4740	0.2000			15	7	**Uranium**
	U238	4.1400	1.1600			134	38	149
	Pu239/240	0.0000	1.5870			0	51	**Transuranic**
	Am241	0.0000	0.2290			0	7	0
05Z1174-026.001 26 11,12, 14	U234	0.0000	84.8000	20.60	26.3	0	2,286	
	U235	0.6030	0.2160			16	6	**Uranium**
	U238	1.4400	1.0200			39	28	55
	Pu239/240	0.0000	1.7741			0	48	**Transuranic**
	Am241	0.0000	0.2560			0	7	0
05Z1174-027.001 27 19	U234	0.0000	82.3000	17.30	26.3	0	1,863	
	U235	0.5750	0.2300			13	5	**Uranium**
	U238	4.7700	1.3000			108	29	121
	Pu239/240	0.0000	1.7186			0	39	**Transuranic**
	Am241	0.0000	0.2480			0	6	0
05Z1174-028.001 28 20, 21	U234	0.0000	83.3000	17.30	26.3	0	1,886	
	U235	0.5250	0.2160			12	5	**Uranium**
	U238	2.0300	1.3900			46	32	58
	Pu239/240	0.0000	1.6355			0	37	**Transuranic**
	Am241	0.0000	0.2360			0	5	0
05Z1174-029.001 29 22	U234	0.0000	78.1000	20.10	26.3	0	2,054	
	U235	0.4000	0.1880			11	5	**Uranium**
	U238	0.7320	1.1000			19	29	30
	Pu239/240	0.0000	1.5177			0	40	**Transuranic**
	Am241	0.0000	0.2190			0	6	0

Survey Area: 3	Survey Unit: 331001	Building: 331G

Description: Building 331G Interior

Media Samples Data Sheet

Site Sample ID / Nbr Description	Nuclide	Sample (pCi/g)	Sample MDA (pCi/g)	Weight (g)	Surface Area (in^2)	Sample Nuclide ($dpm/100cm^2$)	Sample Nuclide MDA ($dpm/100cm^2$)	Sample Total ($dpm/100cm^2$)
05Z1174-030.001 30 23, 24	U234	0.0000	67.2000	19.80	26.3	0	1,741	
	U235	0.4350	0.1690			11	4	Uranium
	U238	1.5600	1.0600			40	28	52
	Pu239/240	0.0000	1.3652			0	35	Transuranic
	Am241	0.0000	0.1970			0	5	0
05Z1174-031.001 31 25, 26	U234	0.0000	70.5000	20.70	26.3	0	1,909	
	U235	0.4430	0.1930			12	5	Uranium
	U238	2.5900	1.0700			70	29	82
	Pu239/240	0.0000	1.5315			0	42	Transuranic
	Am241	0.0000	0.2210			0	6	0
05Z1174-032.001 32 27, 28	U234	0.0000	81.2000	20.50	26.3	0	2,178	
	U235	0.5140	0.2160			14	6	Uranium
	U238	5.1200	1.1400			137	31	151
	Pu239/240	0.0000	1.7048			0	46	Transuranic
	Am241	0.0000	0.2460			0	7	0

PRE-DEMOLITION SURVEY FOR BUILDING 331G

Survey Area: 3 **Survey Unit: 331001** **Classification: 2**
Building: 331G
Survey Unit Description: Building 331G Interior
Total Area: 4,870 sq. m. **Total Floor Area: 1,327 sq. m.**
Grid Spacing for Survey Points: 16m. X 16m.

331 Interior (first floor)

Main Garage Area

STARTING POINT 1 FOR SQUARE SAMPLING GRID (X3, Y55)

331 Interior (second floor)

STARTING POINT 2 FOR SQUARE SAMPLING GRID (X135, Y95)

Garage Key Plan

Garage 2nd Floor Key Plan

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Media Location
- Open/Inaccessible Area
- Area in Another Survey Unit
- Filled in Trenches
- Floor Drain
- Scan Area

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N

0 FEET 45
0 METERS 15

1 inch = 36 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 3-5, 7,-9, 11-13, & 17-20

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

KAISER HILL COMPANY

MAP ID: 02-0589/331-A-001_SC May 25, 2005

ATTACHMENT D

Chemical Data Summaries and Sample Maps

Asbestos Data Summary

Sample Number	Map Sample Location	Room	Material Sampled and Sample Location	Result
Building 331 Garage – RIN 03Z1261				
331-03252003-315-201	201	102	Turquoise paint from CMU partition wall	Trace Chrysotile; < 0.25% Point Count
331-03252003-315-202	202	101	Gray window glazing, west wall	2.0% Chrysotile; 1.5% Point Count
331-03252003-315-203	203	101	Gray window glazing, south wall	3.0% Chrysotile; 2.0% Point Count
331-03252003-315-204	204	101	Beige, turquoise and white paint on CMU, east wall	2.0% Chrysotile; 1.0% Point Count
331-03252003-315-205	205	101	Beige paint on CMU, east wall	Trace Chrysotile; < 0.25% Point Count
331-03252003-315-206	206	101	Gray window glazing, east wall	Trace Chrysotile; < 0.50% Point Count
331-03252003-315-207	207	101	Beige and turquoise paint on CMU, south wall	Trace Chrysotile; < 0.25% Point Count
331-03252003-315-208	208	101	Beige paint on CMU, east wall	Trace Chrysotile; < 0.25% Point Count

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CHEMICAL SAMPLE MAP

Building 331 Garage
Asbestos

331 Interior (first floor)

Main Garage Area

331 Interior (second floor)

Garage Key Plan

Garage 2nd Floor Key Plan

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 45

0 METERS 15

1 inch = 36 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:

CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 02-0589/331_GA_Asb

May 24, 2005

Beryllium Data Summary
Building 331 Garage

Sample Number	Map Point Location	Room	Sample Location (Biased)	Result (ug/100cm^2)
RIN 05C0239				
331-04202005-00-001	1	106B	South Wall	<0.1
331-04202005-00-002	2	Main Gar	B7	<0.1
331-04202005-00-003	3	111	Wall	<0.1
331-04202005-00-004	4	Main Gar	Wall	<0.1
331-04202005-00-005	5	119C	Ceiling	<0.1
331-04202005-00-006	6	111	Floor	<0.1
331-04202005-00-007	7	1st Floor	Ceiling	<0.1
331-04202005-00-008	8	2nd Floor	Floor	<0.1
331-04202005-00-009	9	Main Gar	B6	<0.1
331-04202005-00-010	10	Main Gar	Floor	<0.1
331-04202005-00-011	11	1st Floor	Ceiling	<0.1
331-04202005-00-012	12	Main Gar	Wall	<0.1
331-04202005-00-013	13	1st Floor	Ceiling	<0.1
331-04202005-00-014	14	Main Gar	Overhead	<0.1
331-04202005-00-015	15	1st Floor	Ceiling	<0.1
331-04202005-00-016	16	Main Gar	Wall	<0.1
331-04202005-00-017	17	Main Gar	Floor	<0.1
331-04202005-00-018	18	Main Gar	Floor	<0.1
331-04202005-00-019	19	1st Floor	Ceiling	<0.1
331-04202005-00-020	20	Main Gar	Floor	<0.1
331-04202005-00-021	21	Main Gar	Wall	<0.1
331-04202005-00-022	22	Main Gar	Wall	<0.1
331-04202005-00-023	23	117	Wall	<0.1
331-04202005-00-024	24	Main Gar	Overhead	<0.1
331-04202005-00-025	25	1st Floor	Ceiling	<0.1
331-04202005-00-026	26	Main Gar	Floor	<0.1
331-04202005-00-027	27	1st Floor	Ceiling	<0.1
331-04202005-00-028	28	Main Gar	Overhead	<0.1
331-04202005-00-029	29	106C	Floor	<0.1
331-04202005-00-030	30	Main Gar	Wall	<0.1
331-04202005-00-031	31	Main Gar	Wall	<0.1
331-04202005-00-032	32	Main Gar	Wall	<0.1
331-04202005-00-033	33	1st Floor	Ceiling	<0.1
331-04202005-00-034	34	Main Gar	Overhead	<0.1
331-04202005-00-035	35	1st Floor	Ceiling	<0.1
331-04202005-00-036	36	Main Gar	Overhead	<0.1
331-04202005-00-037	37	Main Gar	Overhead	<0.1
331-04202005-00-038	38	Main Gar	Floor	<0.1
331-04202005-00-039	39	Main Gar	Floor	<0.1
331-04202005-00-040	40	1st Floor	Ceiling	<0.1
331-04202005-00-041	41	Main Gar	Floor	<0.1
331-04202005-00-042	42	Main Gar	Floor	<0.1
331-04202005-00-043	43	130	Floor	<0.1
331-04202005-00-044	44	119	Wall	<0.1

Beryllium Data Summary
Building 331 Garage

Sample Number	Map Point Location	Room	Sample Location (Biased)	Result (ug/100cm^2)
331-04202005-00-045	45	115A	Floor	<0.1
331-04202005-00-046	46	Main Gar	Floor	<0.1
331-04202005-00-047	47	Main Gar	Overhead	<0.1
331-04202005-00-048	48	130	Wall	<0.1
331-04202005-00-049	49	Main Gar	Overhead surface on wall	<0.1
331-04202005-00-050	50	115	Floor	<0.1
331-04202005-00-051	51	115	Floor	<0.1
331-04202005-00-052	52	117	Floor	<0.1
331-04202005-00-053	53	117	Floor	<0.1
331-04202005-00-054	54	130	Floor	<0.1
331-04202005-00-055	55	130	Floor	<0.1
331-04202005-00-056	56	116	Floor	<0.1
331-04202005-00-057	57	116	Floor	<0.1
331-04202005-00-058	58	116	Floor	<0.1
331-04202005-00-059	59	106A	Floor	<0.1
331-04202005-00-060	60	106A	Floor	<0.1

Rev1.

Rev1.

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CHEMICAL SAMPLE MAP

Building 331 Garage
Beryllium

331 Interior (first floor)

Main Garage Area

331 Interior (second-floor)

Garage Key Plan

Garage 2nd Floor Key Plan

Room 117 · Room 117A · Room 201 · Room 203 · Room 111 · Room 111 (shower) · Room 119 · Room 119A · Room 119B · Room 119C · Room 119D · Room 202 · Room 106 · Room 118 · Room 130 · Room 115A · Room 114 · Room 106B · Room 116A · Room 115 · Room 106A · Room 106C · Room 116 · Landing · Steps · Ventilation Room

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 45
0 METERS 15

1 inch = 36 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

Prepared for:

CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 02-0589/331_GA_Be

Apr. 14, 2005

ATTACHMENT E

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, asbestos in Table E-2 and beryllium in E-3. A data completeness summary for all results is given in Table E-4.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for The Building 331 Garage based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2) and the Uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design was optimized by checking actual measurement results (acquired during pre-demolition surveys) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable uncertainties except for the following:

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- ACM was identified in the window glazing and paint on the CMU (2% to 3% Chrysotile and 1% to 2% Point Count) greater than unrestricted release levels. However, prior to the completion of this RLC/PDS, friable and non-friable asbestos abatement and satisfactory clearance sampling was conducted per CDPHE, Regulation No. 8, Part B, *Emission Standards for Asbestos*. Asbestos abatement is still in-progress for the exterior window caulking and transite panels that will be completed prior to demolition.
- Although the radiological surveys of the building conducted as part of this RLC/PDS were less than the PDSP unrestricted release limits, there were five inaccessible, embedded floor drains and two trenches that are potentially contaminated. The remaining embedded sanitary waste drains and piping will be managed as LLW during demolition activities, or until proven otherwise. The filled in trenches will be managed as potentially contaminated LLW until demolition and in-process demolition surveys prove otherwise.

Based upon an independent review of the radiological data, it was determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable unrestricted release levels. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits thereby ensuring data accuracy. All results met the PDS unrestricted release criteria except as noted above for asbestos.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facility. On this basis, Building 331 Garage met the unrestricted release criteria with the confidences stated herein.

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Table E-1 V&V of Radiological Surveys – Building 331 Garage

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	**Measure**	**Frequency**	**COMMENTS**
ACCURACY	initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	field duplicate measurements for TSA	≥5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units 331001(interior) and EXT-B-001 (exterior).	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	See Table E-3 for details.
SENSITIVITY	Detection limits	TSA: ≤ 50 dpm/100cm^2 RA: ≤ 10 dpm/100cm^2	all measures	MDAs ≤ 50% DCGL$_w$ per MARSSIM guidelines (RLC performed to PDS requirements).

Table E-2 V&V of Asbestos Results – Building 331 Garage

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
ASBESTOS	METHOD: EPA 600/R-93/116	LAB ---->	Reservoirs Environmental, Inc	
QUALITY REQUIREMENT		RIN ---->	RIN03Z1216	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial/continuing	below detectable amounts	≥1	Semi-quantitative, per (microscopic) visual estimation.
PRECISION	Actual Number Sampled LCSD Lab duplicates	all below detectable amounts	≥ 8 sample	Semi-quantitative, per (microscopic) visual estimation.
REPRESENTATIVENESS	COC	Qualitative	NA	Chain-of-Custody intact: completed paperwork, containers w/ custody seals.
	Hold times/preservation	Qualitative	NA	N/A
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	See original Chemical Characterization Package (planning document); for field/sampling procedures (located in project file;) thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Measurement Units	% by bulk volume	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	Qualitative	NA	See Table E-4; final number of samples at Certified Inspector's discretion.
SENSITIVITY	Detection limits	< 1% by volume	All measures	N/A

Table E-3 V&V of Beryllium Results – Building 331 Garage

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville Corp. Littleton, Colorado	
QUALITY REQUIREMENTS		RIN ---->	RIN05C0239	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations Initial	linear calibration	≥1	All results were below associated action levels.
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120% (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	MDL of 0.00084 ug/100cm^2	all measures	

Table E-4 Data Completeness Summary – Building 331 Garage

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)[A]	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Asbestos	Building 331G (interior)	8 samples (interior)	8 samples (interior)	[1]ACM identified > 1% by volume	40 CFR765.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN03Z1261 [1]Refer to Section 4.1 and DQA section for discussion of ACM identified > 1% by volume. The ACM was abated prior to this RLCR/PDSR in accordance CDPHE, Regulation No. 8, Part B, *Emission Standards for Asbestos*. Abatement of exterior window caulking is still ongoing but will be completed prior to demolition.
Beryllium	Building 331G (interior)	60 biased (49 random/11 biased)	60 biased (49 random/11 biased)	No beryllium contamination found at any location	OSHA ID-125G RIN05C0239 No results above action level (0.2ug/100cm^2) or investigative level (0.1 ug/100cm^2).
Radiological	Survey Area 3 Survey Unit: 331001 Building 331G (interior)	52 α TSA (22 systematic/30 biased) and 52 α Smears (22 systematic/30 biased) 22 Media samples and 22 PRE and 22 POST TSA and RSA 2 QC TSA 30% scan of the floor; 5% scan of the walls and ceiling	52 α TSA (22 systematic/30 biased) and 52 α Smears (22 systematic/30 biased) 22 Media samples and 22 PRE and 22 POST TSA and RSA 2 QC TSA 75% scan of 1st floor; 30% scan of 2nd floor; and 5% scan of the walls and ceiling	[1]No elevated contamination at any location; all values below PDS unrestricted release levels	Transuranic DCGLs used. [1]Although the radiological surveys of the building conducted as part of this RLC/PDS were less than the PDSP unrestricted release limits, there were five inaccessible, embedded floor drains and two trenches that are potentially contaminated. The remaining embedded sanitary waste drains and piping will be managed as LLW during demolition activities, or until proven otherwise. The filled in trenches will be managed as potentially contaminated LLW until demolition and in-process demolition surveys prove otherwise. Refer to Section 3.0 and DQA for further discussion